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| APPLICATION NO.     | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---------------------|-------------|----------------------|---------------------|------------------|
| 09/919,845          | 08/02/2001  | Sharon Barkai        | 1031-US             | 5670             |
| 24505               | 7590        | 09/20/2006           | EXAMINER            |                  |
| DANIEL J SWIRSKY    |             |                      | MAIS, MARK A        |                  |
| 55 REUVEN ST.       |             |                      | ART UNIT            |                  |
| BEIT SHEMESH, 99544 |             |                      | PAPER NUMBER        |                  |
| ISRAEL              |             |                      | 2616                |                  |

DATE MAILED: 09/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/919,845

Applicant(s)

BARKAI ET AL.

Examiner

Mark A. Mais

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 11 September 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 11 SEP 2006.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on September 11, 2006, has been entered.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an

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international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

3. Claims 1, 2 and 8 are rejected under 35 U.S.C. 102(e) as being anticipated by Zhang et al. (USP 6,687,748).

4. With regard to claims 1 and 8, Zhang et al. discloses determining a communications path in a computer network the method comprising:

    sending a simulated network message within a model of said computer network [**packet-switched (col. 8, lines 1-2) alarm signals, col. 4, lines 27-35]** from a source device component within the model [**Fig. 1, network management server 12, col. 3, lines 10-22]** to a destination device component within said model [**Fig. 1, virtual network device (VND) 38, col. 4, lines 6-13]** along a device component path [**Fig. 1, the path between network management server 12 and VND 38]**,

    wherein the message [**alarm signals]** does not traverse the computer network [**Fig. 1, computer network is interpreted by the examiner as the combination of the “real” network 14 connected to network management server 12 and “real” network devices 16; thus, the alarm signals only traverse the path between VND 38 and network management server 12 and NOT to network devices 16]** and

    recording the device components traversed by the message, thereby determining communications path as well as the validity of the path [**interpreted by the examiner as**

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**recording the traversed VNDs 38 onto the management information base (MIB) 68, when simulation device 18 acts as a virtual device (e.g., a router 36) and records such information as [routing] tables associated with VNDs 38, as well as the status of input/output interfaces [devices] associated with, and communicated to, communication device [router] 36, col. 5, lines 26-33 and 50-60; while network management server 12 “sees” multiple virtual network devices using multiple virtual network addresses, col. 8, lines 34-35 and col. 10, lines 39-49].**

5. With regard to claim 2, Zhang et al. discloses further comprising

**providing the model with a plurality of agents [Fig. 1, simulation devices 18, col. 8, lines 40-41; wherein multiple simulation devices receive requests from network management server 12 and simulates the operation of network devices 16, col. 10, lines 26-49]**

**each agent [Fig. 1, simulation devices 18] corresponding to a destination network element [Fig. 1, any one of multiple network devices 16 can be a one of many network devices to include routers, bridges, etc., col. 3, lines 10-16] of said computer network comprising a plurality of network elements [Fig. 1, multiple network devices 16], and**

**a plurality of device components (DC) [Fig. 1, each simulation device 18 comprises multiple VNDs 38], each of said device components [Fig. 1, multiple VNDs 38] modeling at least one aspect of one of said network elements, said aspect being either of a physical and a functional characteristic of said network element [ each VND 38 is managed by network management server 12 as though it is a physical network device 16, col. 4, lines 11-13; see**

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**also communication device 36 can be configured as a router or any other type of network device in order to communicate with the “virtual” network on behalf of the simulation device 18, col. 5, lines 26-33],**

**wherein each of said agents [multiple simulation devices 18, col. 8, lines 40-41; wherein the simulation devices 18 receive requests from network management server 12 and simulates the operation of network devices 16, col. 10, lines 26-49] comprises a plurality of said device components [Fig. 1, multiple VNDs 38], and**

**wherein at least two of said device components [Fig. 1, multiple VNDs 38] within at least one of said agents [Fig. 1, simulation devices 18] are logically interconnected, each logical interconnection corresponding to either of a physical and a functional interconnection found within or between any of said network elements [multiple VNDs 38 are shown in simulation device 18 wherein each VND 38 is managed as physical network device 16; for example a router and a server, col. 3, lines 10-16].**

### ***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 3-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang et al. as applied to claims 1, 2, and 8 above, and further in view of Hao et al. (USP 6,728,214).

8. With regard to claims 3-4, Zhang et al. discloses a that the sending step **[packet-switched (col. 8, lines 1-2) alarm signals, col. 4, lines 27-35]** comprises each device component along the device component path traversed by the message **[multiple simulation devices 18 use multiple virtual addresses such that multiple alarm signals are sent to network management server 12, col. 11, lines 4-15]**. Zhang et al. discloses that the simulated device components can be routers **[col. 3, lines 10-16]**.

Zhang et al. does not specifically disclose identifying an intermediate device component along the device component path to which the message is to be passed and passing the message and an identifier of the intermediate device component to an immediately next device component in accordance with network routing rules. However, Hao et al. discloses testing network routers by simulating the network topologies **[see Title and Abstract]**. Hao et al. randomly inserts/deletes either an edge (connection), router-node or network node, checks the network topology and routing tables, and further checks the packet forwarding behavior **[col. 4, line 54 to col. 5, line 35; especially with IP protocols such RIP, OSPF, and BGP, col. 5, lines 38-40]**. A packet (such as an IP packet), sent from a first router, via a route containing multiple routers, must be received correctly by the destination router **[col. 7, lines 10-19]**. Since the router-under-test (RUT) has a changing network topology, it must constantly simulate updating the presence of device components [e.g., routing tables], then possibly the absence of device components via a network topology table **[col. 4, lines 30-36]** as if it were in a real network **[col. 3, lines 31-35]**,

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and, therefore, whether the tested router is complying with the network routing rules. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the router of Zhang et al. to include the specific functionality of the router-testing of Hao et al. because such a testing method would allow the network management system to be properly tested for scalability, performance, and reliability while still not incurring the monetary and time burdens that accompany all the network devices in a network environment [see Zhang et al., col. 1, lines 2, lines 13-25].

9. With regard to claim 5, Zhang et al. discloses that the sending step [**packet-switched (col. 8, lines 1-2) alarm signals, col. 4, lines 27-35]** comprises each device component along the device component path traversed by the message [**multiple simulation devices 18 use multiple virtual addresses such that multiple alarm signals are sent to network management server 12, col. 11, lines 4-15]**. Zhang et al. discloses that the simulated device components can be routers [**col. 3, lines 10-16]**.

Zhang et al. does not specifically disclose identifying the intermediate device component within the same network layer. However, Hao et al. discloses testing network routers by simulating the network topologies [see **Title and Abstract**]. Hao et al. randomly inserts/deletes either an edge (connection), router-node or network node, checks the network topology and routing tables, and further checks the packet forwarding behavior [**col. 4, line 54 to col. 5, line 35; especially with IP protocols such RIP, OSPF, and BGP, col. 5, lines 38-40]**. A packet (such as an IP packet), sent from a first router, via a route containing multiple routers, must be received correctly by the destination router [**col. 7, lines 10-19]**. Since the router-under-test



(RUT) has a changing network topology, it must constantly simulate updating the presence of device components [e.g., routing tables], then possibly the absence of device components via a network topology table [col. 4, lines 30-36] as if it were in a real network [col. 3, lines 31-35], and, therefore, whether the tested router is complying with the network routing rules. Thus, Hao et al. discloses identifying the intermediate device component within the same network layer because it inserts/deletes connections and then checks the network topology, routing tables, and checks packet forwarding [col. 4, line 54 to col. 5, line 35; especially with IP protocols such **RIP, OSPF, and BGP, col. 5, lines 38-40**]. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the router of Zhang et al. to include the specific functionality of the router-testing of Hao et al. because such a testing method would allow the network management system to be properly tested for scalability, performance, and reliability while still not incurring the monetary and time burdens that accompany all the network devices in a network environment [see Zhang et al., col. 1, lines 2, lines 13-25].

10. With regard to claim 6, Zhang et al. discloses that the sending step [**packet-switched (col. 8, lines 1-2) alarm signals, col. 4, lines 27-35**] comprises each device component along the device component path traversed by the message [**multiple simulation devices 18 use multiple virtual addresses such that multiple alarm signals are sent to network management server 12, col. 11, lines 4-15**]. Zhang et al. discloses that the simulated device components can be routers [col. 3, lines 10-16].

Zhang et al. does not specifically disclose receiving the message at the immediately next device component and performing different functions based on what network layer the next

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device component is in. However, Hao et al. discloses testing network routers by simulating the network topologies [see **Title and Abstract**]. Hao et al. randomly inserts/deletes either an edge (connection), router-node or network node, checks the network topology and routing tables, and further checks the packet forwarding behavior [col. 4, line 54 to col. 5, line 35; especially with **IP protocols such RIP, OSPF, and BGP, col. 5, lines 38-40**]. A packet (such as an IP packet), sent from a first router, via a route containing multiple routers, must be received correctly by the destination router [col. 7, lines 10-19]. Since the router-under-test (RUT) has a changing network topology, it must constantly simulate updating the presence of device components [e.g., routing tables], then possibly the absence of device components via a network topology table [col. 4, lines 30-36] as if it were in a real network [col. 3, lines 31-35], and, therefore, whether the tested router is complying with the network routing rules.

Thus, Hao et al. discloses receiving the message at the immediately next device component [Fig. 12, **simulated network topology shows the multiples routers between the RUT and the further routers/networks**]; if the message is received from a device component at a higher network layer [for **BGP testing, the testing involves setting up a higher layer TCP connection, then sending update packets to the RUT, col. 11, lines 12-18**]; placing information onto an information stack as may be needed by any device component along the device component path to identify other device components along the device component path to which the message is to be passed [**Each BGP router maintains its preferred paths to all possible destinations (not necessarily the shortest path), the BGP router must advertise these paths to its adjacent multiple routers, col. 9, lines 48-53**]. Since the information identifying intermediate nodes is extracted via the virtual/testing environment, examiner

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**interprets placing the information onto a stack as passing the intermediate node information to the RUT from the original device component path (e.g., Fig. 12, from the farthest BGP router to the RUT); thus, each possible destination node is exchanged, col. 9, lines 60-65]; and if the message is received from a device component at a lower network layer [in OSPF, lower level LSA advertisements are sent out concerning each router's own network connections, col. 8, lines 57-65]; removing information from the information stack needed to identify a subsequent intermediate device component along the device component path to which the message is to be passed [each OSPF router exchanges "hello" packets to maintain adjacency and LSAs to describe its own network connections and learned routes, col. 8, lines 57-65. Since the information identifying intermediate nodes is extracted via the virtual/testing environment, the examiner interprets removing information from the stack as passing the intermediate node information to the RUT from the original device component path (e.g., Fig. 12, from the farthest OSPF router to the RUT); thus, the current network topology is exchanged, col. 8, line 66 to col. 9, line 4.]. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the router of Zhang et al. to include the specific functionality of the router-testing of Hao et al. because such a testing method would allow the network management system to be properly tested for scalability, performance, and reliability while still not incurring the monetary and time burdens that accompany all the network devices in a network environment [see Zhang et al., col. 1, lines 2, lines 13-25].**

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11. With regard to claim 7, Hao et al. further discloses using the removed stack information **[the removed stack information is used to generate the LSA to the RUT and test whether the network topology and learned routes, col. 9, lines 8-39]**.

***Response to Arguments***

12. Applicant's arguments filed September 11, 2006 have been fully considered but they are not persuasive.

13. With respect to claims 1, 2, and 8, Applicant points to the definition in application's specification on page 2, last paragraph, emphasizing that each DC *models* one or more physical and/or logical aspects of the network element **[Applicant's arguments dated September 11, 2006, page 2, lines 20-23]**. Applicant then argues that Zhang et al.'s network management server 12 does not meet Applicant's definition of a device component **[Applicant's arguments dated September 11, 2006, page 2, line 24 to page 3, line 2]**. Moreover, Applicant argues that Zhang et al. presents a network management server 12 that manages virtual network devices, but, apparently, does not *model* virtual network devices **[Applicant's arguments dated September 11, 2006, page 3, lines 3-11]**. The examiner respectfully disagrees.

14. Contrary to Applicant's assertion, network management server 12 does not correspond to the claimed device component. As written in the rejections above, the claimed device components

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(DCs) correspond to multiple VNDs 38 [Fig. 1]. Applicant's specification states that each device component models at least one physical and/or logical aspect of the network element (the device under test) [Applicant's specification, page 2, second paragraph]. As written above, Zhang et al. discloses that each simulation device 18 comprises multiple Virtual Network Devices (VNDs) 38 [Fig. 1] wherein each VND 38 is managed by network management server 12 as though it is a physical network device 16 [col. 4, lines 11-13]. This is specifically interpreted by the examiner as *simulating* the physical network device. Additionally, communication device 36 can be configured as a router or any other type of network device in order to communicate with the "virtual" network on behalf of the simulation device 18 [col. 5, lines 26-33].

### ***Conclusion***

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

(a) Secer (USP 6,990,518), Object-driven network management system enabling dynamically definable management behavior.

(b) Raval et al. (USP 7,020,716), Method and system for verifying the hardware implementation of TCP/IP.

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16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark A. Mais whose telephone number is 572-272-3138. The examiner can normally be reached on M-Th 5am-4pm.

17. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Seema Rao can be reached on 571-272-3174. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

18. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MAM  
September 11, 2006

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